

MELIK-ASLANOVA, P. S.

MELIK-ASLANOVA, P. S.- "Materials on the Morphophysiological Reaction of Skeletal Muscles in Malignant New Growths." Azerbaijan State Med Inst, Baku, 1955  
(Dissertations for Degree of Candidate of Medical Sciences)

SO: Knizhnaya Letopis' No. 26, June 1955, Moscow

MELIK-ASLANOVA, P.S....kand.med.nauk, ROZIN, D.L.

Rare case of primary planocellular keratotic cancer of the renal pelvis.  
Azerb.med.zhur. no.2:99-100 F '58 (MIRA 11:12)

1. Iz Instituta rentgenologii i radiologii Ministerstva zdravookhrane-  
niya Azerbaydzhanskoy SSR (direktor - dots. M.M. Alikishibekov)  
(KIDNEYS--CANCER)

MELIK-ASLANOVA, P.S., kand.med.nauk; ADIGEZALOVA-POLCHAYEVA, G., kand.med.nauk

Case of primary cancer of the Meibomian glands. Azerb.med.zhur.  
no.2:68-69 F '60. (MIRA 13:5)

1. Iz Azerbaydzhanskogo nauchno-issledovatel'skogo instituta  
oftal'mologii (direktor - N.M. Efendiyev).  
(MEIBOMIAN GLANDS--CANCER)

MELIK-ASLANOVA, F.S., kand.med.nauk.

Tumorous diseases of the eye according to data of the Azerbaijan Ophthalmological Scientific Research Institute from 1946 to 1956. Azerb. med. zhur. no.1:40-44 Ja '62. (MIRA 16:5)

1. Iz Azerbaydzhanskogo nauchno-issledovatel'skogo instituta oftal'mologii.(direktor N.M. Efendiyev).  
(AZERBAIJAN--EYE--TUMORS)

ALIZADE, K.A.; MELIK-ASLANOVA, P.S.; NABIYEVA, Z.A.

Treatment of trachoma with biomycin by perforating the conjunctiva  
of the eyelids. Azerb. med. zhur. 41 no.5:59-64 My '64.

(MIRA 18:10)

MELIK-BABAKHANOV, G.V.

Tuberculoma of the lungs. Probl. tub. 38 no. 5:100-102 '60.  
(MIRA 14:1)  
(TUBERCULOSIS)

MELIK-BABAKHANOV, G.V.

Kummell's traumatic spondylitis complicated by generalized amyloidosis. Terap.arkh. 34 no.3:120-122 '62. (MIRA 15:3)

1. Iz kafedry fakul'tetskoy terapii (zav. - dotsent G.V. Melik-Babakhanov) Altayskogo meditsinskogo instituta.  
(VERTEBRAE—WOUNDS AND INJURIES) (AMYLOIDOSIS)

MELIK-BABAKHANOV, G.V.

Correlation between protein and lipoprotein fraction changes in hypertension andtherosclerosis and factors of hypertension and hypercholesteremia: problem of the unity of pathogenesis of hypertension and atherosclerosis. Kardiologiya 3 no.3:58-62 My-Je'63. (MIRA 16:9)

1. Iz kafedry fakul'tetskoy terapii (zav. - dotsent G.V. Melik-Babakhanov) Altayskogo meditsinskogo instituta.  
(BLOOD PROTEINS) (HYPERTENSION)  
(ARTERIOSCLEROSIS) (CHOLESTEROL)



MELIK-BAGDASAROV, G. M.

Diseases of the Bones

Dissertation: "Pathogenesis and Clinical, and Medical Treatment of Chondroperichondritis of the Ribs of the Traumatic Origin." Cand Med Sci, Azerbaydzhan State Medical Inst, 11 March 54 (Bakinskiy Rabochiny, Baku, 2 Mar 54).

SO: SUM 213, 20 Sep 54

MAMEDOV, Z.M., prof. ; MELIK-BAGDASAROV, G.M., kand. med. nauk, dotsent

Report of the Azerbaijan Scientific Medical Society of  
Surgeons for 1964. Azerb. med. zhur. 42 no. 7:92-94 J1 '65  
(MIRA 19:1)

1. Predsedatel' pravleniya Azerbaydzhanskogo nauchno-meditsinskogo  
obshchestva khirurgov (for Mamedov). 2. Uchenyy sekretar' Azer-  
baydzhanskogo nauchno-meditsinskogo obshchestva khirurgov (for  
Melik-Bagdasarov).

MELIK-BAGDASAROV, S. M.

Melik-bagdasrov, S. M. "Factory processing and sense of old asphalt," Gor. khoz-vo  
Moskvy, 1949, No. 3, p. 37-38.

SO: U-3736, 21 May 53, (Letopis 'Zhurnal 'nykh Statey, no. 18, 1949).

MELIK-BAGDASAROV, S.M.; GEZENTSVEY, L.B., red.; VARGANOVA, A.N., red.  
izd-va; KHENOKH, F.M., tekhn.red.

[Colored pavements for park walks] TSvetnye pokrytiia parkovykh  
dorozhek. Moskva, Izd-vo M-va kommun.khoz.BSFSR, 1961. 50 p.  
(MIRA 15:2)

(Sidewalks)

MELIK-BAGDASAROVA, M. G.

# U S S R J

✓ Metabolic changes in tissues of rats on inadequate protein diet. O. N. Abbakumova-Zepalova, Yu. M. Gelfer, B. L. Glinka-Chernorutskaya, M. G. Melik-Bagdasarova, B. I. Turchenko, and B. K. Tydmsh-Chervenkova (1st Leningrad Med. Inst.). *Ukrain. Biokhim. Zhur.* 22, 253-65 (1950); cf. *Byull. Eksp. Biol. i Med.* 27, 504 (1949).—Quantitatively and qualitatively inadequate protein diet causes various metabolic disturbances affecting neuro-humoral regulation. Adequate quantity and quality of protein must be fed both healthy and sick people with protein deficiency. With 83 rats, it was found that in both liver and muscle acetone bodies increase considerably, 11-fold in liver as against the norm (85 rats), i.e. 29.2 mg. % as against 2.83 mg. %; in muscle a 6-fold increase (3.0 mg. % in norm and 30.3 mg. % in exptl.). During protein-deficient diet the content of acetone bodies was considerably higher than during starvation, despite complete absence of carbohydrate supply, and even more strikingly shown was the decrease in glycogen during starvation. The coeff. expressing ratio of lipide T/cholesterol was 0.88 (29 rats) in the norm, which increased to 1.11 (86 rats) on a low-protein diet, i.e., is detd. by quantity of phospholipides and by simultaneous decrease in cholesterol content. The reverse phenomenon was noted during complete starvation, the ratio decreasing to 0.70, depending primarily upon phospholipides. Cholesterol fluctuations were normal. Total blood glutathione remained in the normal range, but the ratio between its various forms varied, the oxidized form increasing and the reduced form decreasing (86 exptl. rats, 17 of them controls). No

ABBAKUMOVA - ZEPALOVA, O.N.  
such changes were observed during starvation. Oxidation-reduction processes did not show quant. or qual. disturbances during complete starvation. A study of various metabolic indicators in humans suffering from protein deficiency and showing hypoproteinemia (extensive burns, inflammatory osteomyelitis, and others) has shown various disturbances, (protein, carbohydrate, and other indexes of metabolic disturbances) which have an effect upon the nervous system and upon neuro-humoral regulation, by acting on nerve receptors and centers which control physiol. processes.  
Clayton R. Holoway

2/2

MELIK-BAKHTAMYAN, I.Ya., kandidat tekhnicheskikh nauk.

Designing bridges with the aid of a current flow plan. Trudy  
TbilZNT no.22:88-117 '50. (MLRA 9:11)  
(Bridge construction) (Hydraulics)

MELIK-BAKHTAMYAN, I.Ya.

Classification of river regulation and shore protection  
structures. Trudy GPI [Gruz.] no.7:109-113 '63.  
(MIRA 18:6)



MELIK-BARKHUDAROV K.B.

TUMIKYAN, G.G.; MELIK-BARKHUDAROV, K.B.

Structural plan of the southeastern part of the northern edge of the  
lower Kura Lowland. Azerb. neft. khoz. 36 no.5:4-7 My '57.  
(Kura Lowland---Geology, Structural) (MIRA 10:11)

MELIK-BARAKHODAROV, K.B.; TUMIKYAN, G.G.

Tectonics of the Alyaty upland. Geol. nefti 2 no.11:28-30 N '58.  
(MIRA 11:12)

1. Ministerstvo neftyanoy promyshlennosti AzerSSR.  
(Kobystan--Geology, Structural)

MELIK-BARKHUDAROV, K.B.; TUMIKYAN, G.G.

Main fault of the Alyaty Upland and its effect on the distribution  
of oil and gas. Geol.nefti i gaza 6 no.5:37-39 My '62.  
(MIRA 15:5)

1. Armyanskoye geologicheskoye upravleniye i Ob'yedineniye  
Azerbaydzhanskoy neftyanoy promyshlennosti.  
(Kobystan--Petroleum geology) (Kobystan--Gas, Natural--Geology)

GOR'KOV, L.P.; MELIK-BARKHUDAROV, T.K.

Theory of the superfluidity of an imperfect Fermi gas. Zhur.  
eksp. i teor. fiz. 40 no.5:1452-1458 My '61. (MIRA 14:7)

1. Institut fizicheskikh problem AN SSSR.  
(Quantum field theory)  
(Electron gas)

ARUTYUNYAN, V.M.; VARTANYAN, Yu.L.; CHUDARYAN, E.V.; SHAKHBAZYAN,  
V.A.; AMATUNI, A.TS.; DZHRBASHYAN, V.A.; MELIK-BARKHUDAROV,  
T.K.; TEVIKYAN, R.V.; BERESTETSKIY, V.B., prof., red.;  
SHTIBEN, R.A., red. izd-va; KAPLANYAN, M.A., tekhn. red.

[Problems in the theory of strong and weak interactions of  
elementary particles; lectures] Voprosy teorii sil'nykh i  
slabykh vzaimodeistvii elementarnykh chastits; lektsii. Pod  
obshchei red. V.B.Berestetskogo. Erevan, Izd-vo Akad. nauk  
Armianskoi DDR, 1962. 190 p. (MIRA 15:5)

1. Akademiya nauk Armyanskoy SSR. Fizicheskiy institut.  
(Nuclear reactions)

GOR'KOV, L.P.; MELEK-BARKHUDAROV, T.K.

Microscopic derivation of Ginzburg-Landau equations for an  
anisotropic superconductor. Zhur. eksp. i teor. fiz. 45  
no.5:1493-1498 N '63. (MIRA 17:1)

1. Institut fizicheskikh problem AN SSSR.

ACCESSION NR: AP4042404

S/0056/64/047/001/0311/0324

AUTHOR: Melik-Barkhudarov, T. K.

TITLE: Lower critical field and nonlinear effects in the electro-dynamics of superconducting alloys

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 311-324

TOPIC TAGS: superconductivity, critical magnetic field, penetration depth, alloy, superconducting alloy

ABSTRACT: The lower critical field, defined as the field at which a magnetic field begins to penetrate into a superconductor, is determined for strongly contaminated alloys over the entire temperature range. Unlike the result of A. A. Abrikosov (ZhETF v. 32, 1442, 1957), the expression obtained here for the critical field contains a temperature dependence, although it is identical with the former in all other respects. The formula is valid for the entire range of tem-

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ACCESSION NR: AP4042404

peratures. In addition, the author calculates the corrections to the depth of penetration of a weak magnetic field into the superconducting alloy. Orig. art. has: 5 figures and 59 formulas.

ASSOCIATION: Fizicheskiy institut GKAE, Yerevan (Physics Institute GKAE)

SUBMITTED: 03Feb64

ATD PRESS: 3083

ENCL: 00

SUB CODE: EM, SS

NR REF SOV: 004

OTHER: 004

Card

2/2



L 1303-66 EWT(1)/EWT(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b) LIP(c) JD/GG  
 ACCESSION NR: AP5012543 UR/0181/65/007/005/1368/1374

AUTHOR: Melik-Barkhudarov, T. K.

TITLE: On the jump of heat capacity in superconductors

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1368-1374

TOPIC TAGS: superconductivity, heat capacity, phonon interaction, electron interaction, Green function

ABSTRACT: The author examines the discontinuity in the electronic specific heat which takes place in the superconducting transition point, using the electron-phonon model which was investigated in detail by G. M. Eliashberg (ZhETF v. 39, 1437, 1960). The coupling constant is not assumed to be weak as in the earlier investigations. It is shown that the transition is hardly influenced by the region where the attenuation of the excitations becomes of the same order as the energy gap. The analysis is carried out by methods of quantum field theory in which the system of interacting electrons and phonons is regarded by means of Green's functions. The value of the electronic specific heat and of the critical temperature are determined. The latter is found to be smaller than given by the theory of Bardeen, Cooper, and Schrieffer. It is indicated that the discrepancy between theory and experiment on the specific heat must be sought in some new physical mechanisms. "I am grateful to L. P. Gor'kov and G. M. Eliashberg for valuable remarks and a

Card 1/2

L-1303-66

ACCESSION NR: AP5012543

discussion of the work." Orig. art. has: 21 formulas.

ASSOCIATION: none

SUBMITTED: 02Nov64

ENCL: 00

SUB CODE: SS

NR REF SOV: 004

OTHER: 004

*mlr*  
Card 2/2

MELIK-DAVYAN, L. S.

Characteristics of the mineralogical composition of loess in the  
northeastern Arzv region. Zap. Vses. min. sb-vz 89 no.1:117-126  
'60. (MIRA 13:10)

(Arzv region--Loess)

TOLSTIKHIN, N.I.; MELIK-DAVTYAN, L.S.

Life and work of N.F. Pogrebov; on the 100th anniversary of his  
birth. Inform.sbor. VSEGEI no.48:25-50 '61. (MIRA 15:7)  
(Pogrebov, Nikolai Feodorovich, 1860-1942)  
(Geology)

Melik-Davtyan, R. L.

USSR/Electronics - Semiconductor Devices and Photocells, H-8

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35212

Author: Sominskiy, M. S., Makhov, A. F., Melik-Davtyan, R. L.

Institution: None

Title: On the Effect of Electrodes on the Rectifying Properties of a Crystal Detector.

Original

Periodical: Sb. statey Leningr. in-ta. tochnoy mekhan. i optiki, 1955, No 18, 142-153

Abstract: Detailed investigation of the effect of pressure, material, shape, and dimensions of the upper electrodes, and also of the effect of the method of preparation of the lower electrode on the rectifying properties of a Germanium detector. The optimum values of the above electrode parameters are established. Bibliography, 9 titles.

Card 1/1

BOGUSLAVSKIY, A.Ya.; MELIK-DATT'YAN, R.S.

Case of intravital x-ray diagnosis of cancer of the horizontal  
portion of the lower segment of the duodenum. Vest.rent.1 rad.  
35 no.1:60-61 Ja-F '60. (MIRA 13:6)  
(DUODENUM neopl.)

BEIYAKOV, Ye.P., otv. red.; GINZBURG, N.Ya., otv. red.; KRICHEVSKIY,  
Ya.M., otv. red.; MELIK-GAYKAZOV, V.I., otv. red.; TIKHONOVA,  
Ye.D., red.; SELEZNEV, P.I., tekhn. red.

[Rolling mills] Stany prokatnye. Moskva, TSINTImash, 1960. 137 p.  
(MIRA 15:11)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy nauchno-tekhnicheskoy  
komitet.

(Rolling mills)

S/194/61/000/012/048/097  
D256/D303

AUTHOR: Melik-Gaykazov, V. I.

TITLE: Acceleration-recording apparatus for load-lifting and transporting machines

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 12, 1961, 30, abstract 12V254 (Tr. Vses. n.-i in-ta pod"yomno-transp. mashinostr., 1960, no. 9, 50-56)

TEXT: A number of instruments used by research organisations was considered in order to choose a most suitable one for experimentally determining accelerations of the moving parts of load-lifting machines at various conditions of operation. A resistance stress wire gauge instrument developed by the NIB-Vagonostroyeniye (Railway Coachbuilding Research Bureau) was found most suitable. The range of measurements of the instrument is from 0 to 10 g at frequencies from 1 to 100 c/s. The elements are made of 200 ohm, 22 mm long constantan wire stuck to a strip of varnished cambric. The results of the static and dynamic calibrations are presented and a description is

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Acceleration-recording ...

S/194/61/000/012/048/097  
D256/D303

given of the testing arrangement construction, the amplifier and oscillograph used and ways of overcoming the parasitic vibrations. There are 8 figures and 4 references. / Abstractor's note: Complete translation. /

Card 2/2

This paper was presented at a Joint session of the Laboratory Seminar and of the Telephony at NII on January 6, 1956. The fundamentals of mathematical analysis of communication networks using matrix algebra are presented. Problems in the structural theory of communications networks are discussed: calculations of the number of tandem trunks between any two stations in the network, determination of the length of the longest and shortest tandem trunk, of the length of the longest relation ship between the trunk, of the difference and composition between the structural parameters. The algorithms for the calculation of the structural theory of communication networks, graphical theory and theory of contact circuit, is discussed. There are 17 references, 13 Soviet (including translation), 4 foreign references, 2 English, 1 German. There are 7 references, 3 Soviet and 4 English.

MELIK-GAYKAZOVA, E.I., KHARKEVICH, A.D.

Determination of the optimum coefficient of expansion in a two-stage switching circuit which is used in link selecting operation.  
Probl. pered. inform. no. 4:27-34 '59. (MIRA 13:7)  
(Telephone, Automatic) (Switching theory)

MELIK-GAYKAZOVA, E.I.; KHARKEVICH, A.D.

Study of the structural parameters of group hunting units.

Probl.pered.inform. no.6:57-63 '60.

(MIRA 13:11)

(Telephone, Automatic)

MELIL-GAYKAZOVA, N.I.

Stress distribution in turbodrill parts. Neft. khoz.  
38 no.6:41-45 Je '60. (MIRA 13:7)  
(Turbodrills) (Strains and stresses)

L 46276-66 EWT(1) IIP(c) AT  
ACC NR: AR6004344

SOURCE CODE: UR/0274/65/000/009/V009/V009

AUTHOR: Melik-Gaykazova, E. I. 50

REF SOURCE: Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR, vyp: 23, 1964, 150-158 13

TITLE: 'Losses in an accessible beam transmitting on Erlang current

SOURCE: Ref. zh. Radiotekhnika i elektrosvyaz', Abs. 9V73

TOPIC TAGS: multiple beam transmission, telephone system, signal transmission, voice communication

TRANSLATION: The probability of losses attached to the maintenance of a current is determined by instruments using an accessible beam. The current is statistically determined by Erlang's  $k$ -distribution. The duration of service is assumed to be distributed exponentially. The extent of the deviation of the losses attached to the maintenance of Poisson and Erlang currents is investigated. The results of the computations of losses are shown for various values of the current parameter  $k$  and various capacitances of the beam. A graph of the dependence of losses upon the current intensity for  $k=1, 2, 4$ , and  $5$  is shown using three auxiliary instruments. Losses in  $k$  for intensities of  $0.5$  and  $1$  Erlang using three auxiliary instruments are also graphed. 3 figures, 3 tables, 2 titles. A. B.

SUB CODE: 09/ SUBM DATE: none

UDC: 621.395.1

Card 1/1 7/1

MELIK-GAYKAZOVA, N.I., inzh.

Simplified formula for determining the axial load of a tie. Trudy  
VNIIBT no.3:60-62 '61. (MIRA 15:1)

(Turbodrills)

MELIK-GAYKAZIAN, I. Ya.

"Characteristics of the Structure of the Earth's Core on the Basis of the Interpretation of Seismic Observations." Sub 13 Jun 51, Geophysics Inst, Acad Sci USSR

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55.



MELIK-GAYKAZYAN, I.Ya.

Some structural features of the earth's core based on the interpretation of seismic observations. Trudy Geofiz. inst. no.22:59-94 '54.  
(Earth--Internal structure)(Seismology-- (MIRA 8:4)  
Observations)

60-55-26-10/16

AUTHOR: Melik-Gaykazyan, I. Ya.

TITLE: Structure of the Earth's Core (O stroynii zemnogo yadra)

PERIODICAL: Trudy Geofizicheskogo instituta Akademii nauk SSSR, 1955, Nr 26, pp 117-120 (USSR)

ABSTRACT: At the boundary of the Earth's core the propagation rate of longitudinal waves decreases by sharp breaks, so that known methods for determining speed of propagation as a function of depth cannot be applied. The author constructs a hodograph of seismic waves reflected from the Earth's core based on observational data analysed by the author and draws conclusions on propagation rates inside the core and of the possibility of a layer of decreased velocity near the boundary of the core. Modern theory suggests that both the core and the mantle may have the same composition and that the difference in their characteristics is explained by phase transition of substances in the Earth's interior. The theory of the phase transition of substances in the Earth's interior is supported both by the sharpness of the boundary line between the core and the innermost core and anomalous velocity of elastic waves close to the

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60-55-26-10/16

Structure of the Earth's Core

boundary of the core and innermost core. There are 2 figures and 6 references, of which 3 are Soviet and 3 English.

AVAILABLE: Library of Congress

Card 2/2

BOV/139-58-5-30/35

AUTHORS: Melik-Gaykazyan, I. Ya. , Yermolayev, V. A.

TITLE: Preparation of Alkali-Halide Monocrystals from Saturated Aqueous Solutions (Polucheniye shchelochno-galoidnykh monokristallov iz peresyshchennykh vodnykh rastvorov)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, fizika, 1958, Nr 5, pp 141-143 (USSR)

ABSTRACT: The paper was presented at the Conference of Higher Education Establishments at Tomsk, February 1958, on Di-electrics and Semiconductors. The paper deals with growth of monocrystals of KCl, KBr and KI from saturated aqueous solutions. KI crystals were grown in a thermostatted room by rotation of a crystal about the crystallizer axis and about its own axis with simultaneous lowering of temperature. This is known as the planetary method. Temperature was lowered first at the rate of 0.2 and later at 0.5°C per 24 hours. The KI crystals of 40-50 g weight were grown in 10-15 days. The KI crystals grown on lowering of temperature from 35 to 30°C had octahedral form (Fig.1); those grown on lowering the temperature from 40 to 35°C were octahedra with subordinate cubic edges (Fig.2) and those between 45 and 40°C were cubo-octahedra (Fig.3). KCl was grown in crystallizers with individual heating. Each crystallizer was hermetically sealed. KCl and KBr grow very slowly from saturated aqueous solutions.

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SOV/139-58-5-30/35

## Preparation of Alkali-Halide Monocrystals from Saturated Aqueous Solutions

The crystals are in the form of octahedra (Fig.4) and are transparent if small in size. By addition of about 0.02 mol.% of lead chloride, KCl crystals of up to 40 g weight were produced (Fig.5); such crystals took about 20 days to grow. Transparent large crystals of KCl were also obtained in the presence of 0.04 mol.% of zinc chloride (Fig.6). Properties of the crystals grown from aqueous solutions were compared with the properties of crystals grown by the Kyropoulos method (Ref.2). The density  $\rho$ , microhardness  $H$ , hardness obtained on mutual polishing of the two types of crystals, Young's modulus  $E$  and a refractive index  $n$  of the crystals grown from aqueous solutions and by the Kyropoulos method are given in a table on p 142. The data listed in this table show that mechanical properties of crystals grown from aqueous solutions are somewhat better than the properties of crystals prepared from melt (Kyropoulos method). Acknowledgements are

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SCV/139-58-5-30/35

Preparation of Alkali-Halide Monocrystals from Saturated Aqueous Solutions

made to Professor and Dr. A. A. Vorob'yev for suggesting this work. There are 6 figures, 1 table and 3 references, 2 of which are Soviet and 1 German.

ASSOCIATION: Tomskiy politekhnicheskii institut imeni S. M. Kirova  
(Tomsk Polytechnical Institute imeni S. M. Kirov)

SUBMITTED: April 17, 1958.

Card 3/3

MELIK-GAYKAZYAN, I.Ya.; SARATOVKIN, D.D.; KLISS, A.G.

Effect of pectin on the crystallization of ammonium chloride.  
Izv. TPI 95:372-377 '58. (MIRA 14:9)  
(Pectin) (Ammonium chloride crystals--Growth)

SOV/70-4-3-30/32

**AUTHORS:** Melik-Gaykazyan, V.I. and Melik-Gaykazyan, I.Ya.

**TITLE:** On the Question of the Influence of Pectin on the Crystallisation of Ammonium Chloride

**PERIODICAL:** Kristallografiya, 1959, Vol 4, No 3, pp 435-437 (USSR)

**ABSTRACT:** Ehrlich's experiments on the crystallisation of  $\text{NH}_4\text{Cl}$  in the presence of pectin (Ref 1) were repeated. Crystals grown by cooling an aqueous solution (with 0.01% pectin) from 60 to 20 °C over two days are illustrated. The influence of pectin on the solubility of  $\text{NH}_4\text{Cl}$  was measured. A solution of  $\text{NH}_4\text{Cl}$  was continuously passed backwards and forwards between two cylinders in a thermostat flowing slowly over solid material. The density was measured with a hydrometer. Curves of density against concentration were measured at 10, 20, 30, 40, 50 and 60 °C, each curve reaching a maximum (of density). When compared with curves for the solubility of  $\text{NH}_4\text{Cl}$  in water and in 0.3% agar-agar the solubility of  $\text{NH}_4\text{Cl}$  in 0.5% pectin solutions was increased by some 3%, when the

Card1/2



On the Question of the Influence of Pectin on the Crystallisation of  
Ammonium Chloride

SOV/70-4-3-30/32

solution was being cooled and supersaturation occurred whereas the solubility measured on solutions saturated at a given temperature were normal. Pectin strongly increases the viscosity of the solution but this effect can be ruled out by the check experiment with agar-agar. No explanation is advanced for the phenomenon in this paper.

There are 6 figures and 2 references, of which 1 is Soviet and 1 German.

ASSOCIATION: Tomskiy politekhnicheskii institut (Tomsk Polytechnical Institute)

SUBMITTED: February 9, 1959

Card 2/2

S/058/61/000/007/024/086  
A001/A101

**AUTHORS:** Melik-Gaykazyan, I.Ya., Treskina, M.N., Zavadovskaya, Ye.K.  
**TITLE:** Dependence of F-center density and half-width of F-band on the composition of KCl-KBr mixed crystals  
**PERIODICAL:** Referativnyy zhurnal. Fizika, no. 7, 1961, 140, abstract 7V304 ("Dokl. Mezhvuz. nauchn. konferentsii po spektroskopii i spektr. analizu". Tomsk, Tomskiy-un-t, 1960, 119 - 121)

**TEXT:** The authors investigated the F-band of absorption in KCl-KBr mixed crystals of variable composition grown from the melt and from the solution. Maximum deviations of the half-width of the F-band from the additive value is observed in the compound consisting of 80 mol. per cent KBr in KCl. The largest concentration of Schottky defects corresponds to the same composition; this apparently explained the deviation of the half-width of the F-band from the additive value. Concentration of F-centers in KCl-KBr crystals is lower than in pure crystals of KCl and KBr. It is possible that the lesser stability of F-centers in solid solutions is caused by asymmetry of surroundings of the color

Card 1/2

Dependence of F-center density ...

S/058/61/000/007/024/086  
A001/A101

center and increased density of dislocations in the mixed crystal. An inverse dependence of F-center stability on thermal luminescence and density of F-centers is established.

E. Nagayev

[Abstracter's note: Complete translation]

Card 2/2

83366

24.7700

9.4300

S/139/60/000/004/033/033

E201/E591

AUTHORS: Vorob'yev, A.A. and Melik-Gaykazyan, I. Ya.  
TITLE: Electron and Hole Centres in Ionic Crystals and the Lattice Energy

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,  
1960, No.4, p.239

TEXT: Many physical and chemical properties of real ionic crystals are related to the lattice energy (Ref.1). The lattice energy characterizes an ideal crystal and its relationship with real crystals suggests that crystal imperfections may be governed by this energy (Ref.2). Among the defects related to the lattice energy are electron capture centres in alkali-halide crystals (Ref.3). It is also known that the energy quantum corresponding to an absorption band maximum rises with increase of the lattice energy in ionic crystals (Refs.4,5). Several electron and hole centres have their own absorption bands, each is characterized by a definite binding energy of the excess charge captured in the lattice. Figs. 1 and 2 compare the energy quanta corresponding to the maxima of electron and hole bands with the energy lattice of NaCl, KCl and KBr using Seitz's data (Refs. 6, 7). For all

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E201/E591

Electron and Hole Centres in Ionic Crystals and the Lattice Energy  
these electron and hole centres the electron or hole binding  
energy rises with increase of the lattice energy, showing a definite  
relationship between defects in an ionic lattice and its energy.  
There are 2 figures and 7 references: 5 Soviet and 2 English. LX

ASSOCIATION: Tomskiy politekhnicheskii institut imeni S.M.Kirova  
(Tomsk Polytechnical Institute imeni S. M. Kirov)

SUBMITTED: September 21, 1959

Card 2/2

MELIK-GAYKAZYAN, I. YA.

81959  
S/181/60/002/04/19/034  
B002/B063

24.7600  
AUTHORS:

Zavadovskaya, Ye. K., Ivankina, M. S., Melik-Gaykazyan,  
I. Ya.

TITLE:

The Problem of the Influence of Annealing on the Physical  
Properties of Solid Solutions of Alkali Haloid Salts

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 4, pp. 665-669

TEXT: Mixed crystals composed of 51% KCl and 49% KBr, as well as 49.3% NaCl and 50.7% NaBr were bred by Kyropoulos' method. The crystals were kept at 600°C for 5, 10, 20, 25, 50, and 75 hours; the temperature was kept constant with an accuracy of  $\pm 2^\circ\text{C}$  with the aid of the recording device ЭПП-09 (EPP-09). The following was then measured on the crystals: density, lattice constant, molecular concentration, linear expansion coefficient, and heat conductivity (Tables 1 and 2). The cleavage faces of the crystals were examined with the aid of a polarization microscope and the camera "Зенит" ("Zenit"). (Figs. 1, 2, and 3). On heating, the vacancies are concentrated and form negative crystals inside. The faces {100} and {110} are particularly developed. Cleavage cracks are the cause of the

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The Problem of the Influence of Annealing  
on the Physical Properties of Solid  
Solutions of Alkali Haloid Salts

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B002/B063

resulting pores which are aligned in one row (Fig. 3). Since the vacancies migrate also to the free crystal surface, a longer heating also leads to a slight increase in density. The temperature dependence of the electrical conductivity of a K(Cl,Br) crystal was also determined. The said crystal was heated four times successively (Fig. 4). After each heating, conductivity rose further. This is possibly also due to the pore formation. Mention is made of papers by R. I. Garber, L. M. Shamovskiy, and Ya. Ye. Geguzin. There are 4 figures, 2 tables, and 9 references: 8 Soviet and 1 British.

ASSOCIATION: Tomskiy politekhnicheskii institut  
(Tomsk Polytechnic Institute)

SUBMITTED: June 16, 1959

Card 2/2

ZAVADOVSKAYA, Ye.K.; IVANKINA, M.S.; MELIK-GAYKAZYAN, I.Ya.

Pore formation during annealing of mixed KCl-KBr crystals. Kristallografiia 5 no.2:324-325 Mr-Apr '60. (MIRA 13:9)

1. Tomskiy politekhnicheskii institut.  
(Potassium chloride) (Potassium bromide)



MELIK-GAYKAZYAN, I.Ya.; ZAVADOVSKAYA, Ye.E.; TRESKINA, M.N.

Distribution of impurities in crystals of alkali halide salts.  
Kristallografiia 5 no.3:477-478 '60. (MIRA 13:8)

1. Tomskiy politekhnicheskii institut im. S.M.Kirova.  
(Alkali halide crystals)

20623

~~9.4305 (1145, 1147, 1155)~~  
~~24.7800 1043, 1144, 1160~~

S/063/60/005/005/012/021  
A051/A023

**AUTHORS:** Vorob'yev, A.A., Professor, Zavadovskaya, Ye.K., Professor,  
Boldyrev, V.V., Candidate of Chemical Sciences, Melik-Gaykazyan,  
I.Ya., Candidate of Physical and Mathematical Sciences, Savintsev,  
P.A., Candidate of Physical and Mathematical Sciences

**TITLE:** Physico-Chemical Problems of Dielectrics

**PERIODICAL:** Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D.I.  
Mendeleyeva, 1960, No. 5, Vol. 5, pp. 573-582

**TEXT:** Dielectrical materials should have a high thermal, chemical and radiation resistance, a high mechanical and electrical strength, in some cases they should have a low value of the angle of losses, a low electroconductivity and a high dielectrical constant (Ref. 1). Some of the more recent fields of application are scintillation counters, where the dielectrics with a large width of the forbidden zone of energy are used, or in explosives (Ref. 2), where the electronic and ionic processes which occasionally take

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A051/A029

Physico-Chemical Problems of Dielectrics

place in the dielectrics are applied. In outlining the physico-chemical properties of dielectrics, the connection between these properties are discussed in reference to the energy of the lattice. It is pointed out that, since little is known of the physical processes in dielectrics when acted upon by an electrical field, chemistry and the science of electrical materials is mostly empirical. The physical properties of dielectrics in relation to their chemical composition and structure were studied. The dielectrical properties of simple substances with a known chemical composition were investigated (Ref. 1,4-24). It was found that the main properties of the dielectrics (thermal resistance, binding energy of the electron in the lattice, mechanical strength, optical properties, etc.), were directly determined by the strength and nature of the particle bond in the lattice. Under the effect of external conditions the interaction energy between these particles can be overcome and the lattice destroyed. A number of graphs are presented indicating how the various properties are affected by the lattice energy, i. e., the energy value necessary to divide the crystal lattice, consisting of ions, to individual ions and separation of these from one another to an infinitely large distance at a temperature of absolute zero. The case of binary ionic compounds of the  $A_m B_n$  type, as described by Kapustinskiy (Ref. 25),

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Physico-Chemical Problems of Dielectrics

is given where the calculation of the energy of the lattices with a coordination number 6, is estimated according to formula (1):  $U = 256.1$

$(a + b) \frac{W_A \cdot W_B}{R_A + R_B}$  where  $a$  is the number of cations,  $b$  the number of anions,  $W_A$  and  $W_B$  the valencies of the anion and the cation,  $R_A$  and  $R_B$  the radii of the corresponding ions for the structure of a lattice of the sodium chloride type. A later version of the formula, where also the repulsion, as well as the attraction of the ions is considered, is given as:

$$U = 287.2 \frac{W_A \cdot W_B (a + b)}{R_A + R_B} \left(1 - \frac{0.345}{R_A + R_B}\right) \quad (2).$$

The ionic crystals have a high value of lattice energy and thus also a high value of thermal and mechanical strength. In the case of isodesmic ionic lattices of the same structural type, the properties of the materials are connected with the energy of the crystal lattice determined by the chemical composition. Fig. 1 is a graphical representation of the effect of the hardness according to Moos, melting point, electrical strength of the ionic crystals by the lattice energy, Fig. 2 shows the same relationship for alkali earth metal oxides. From equation 1 it is seen that with a decrease in the size of the particles, which make up

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A051/A029

# Physico-Chemical Problems of Dielectrics

the lattice, the lattice energy increases. Fig.3 represents the relationship between the change in volume of an elementary nucleus of a molecule (Ref.3) in various compounds according to data from X-ray analyses, and the lattice energy for crystals of alkali-halide compounds. Fig.4 gives the relationship of the number of ions  $n$  in one  $\text{cm}^3$  to the lattice energy for crystals of alkali-halide salts. The value of  $n$  was determined from:

$$n = \frac{N \cdot d}{2(A_1 + A_2)} \quad (3), \text{ where } N \text{ is } = 6.06 \cdot 10^{23}, d \text{ the specific gravity, } A_1 \text{ and } A_2$$

atomic weights of the ions. The specific thermal capacity  $c_p$ , at a constant pressure, is given in Fig.5 in relation to the lattice energy, and Fig.6 shows the relationship of the melting heat to the lattice energy. Experiments showed that the optical properties of ionic crystals also depend on the lattice energy. With an increase in the latter, the absorption of light changes in the infrared, visible and ultraviolet regions according to certain rules. The electronic polarizability in relation to the lattice energy for alkaline halides is shown in Fig.8 (Ref.30,31). A decrease or an increase of the dielectrical constant and of its components will be noted due to the shift in the ions corresponding to the change in the ion polarizability of the ions and their concentration with a change in the lattice energy. Fig.9 represents

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Physico-Chemical Problems of Dielectrics

sents the change in the electronic component of the dielectrical constant with a change in the lattice energy for crystals of the alkali-halide compound series. The relationship of the electroconductivity to the temperature of ionic crystals is described by the formula:

$\sigma = \sigma_1 e^{-u_1/kT} + \sigma_2 e^{-u_2/kT}$ , where  $u$  is the activation energy of the liberation processes of the ions in the lattice. Experimental data showed that a significant increase of the high-temperature range of the activation energy takes place with an increase in the lattice energy of the alkali-halide salt crystals. The sum of the activation energies at low and high temperatures was found to depend on the lattice energy. The conclusion is drawn here that the electroconductivity of the crystals is connected with the energy of the crystal lattice in a law sequence. Other properties, such as the effective mass of the electron and the magnitude of the oscillating quantum, are also thought to depend on the lattice energy. It is pointed out here that these relationships must be accurately established. The electrical strength of the dielectric is thought to increase with an increase in the lattice energy (Fig.10). Other properties, such as the thermal resistance of the

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Physico-Chemical Problems of Dielectrics

ionic crystals are in a reverse relationship to the lattice energy, but this phenomenon is assumed to be illusory, since the decomposition of these substances is also determined by the ionization potential, as well as the lattice energy. The reverse relationship is also observed in the case of the heterodesmic structures. Data obtained from Refs. 9, 10 on a comparison of the physico-chemical properties of liquid and gaseous organic dielectrics with their electrical strength in the aliphatic hydrocarbon series showed that the electrical strength changes sympathetically with the change in the intermolecular bond strength and does not depend on the bond strength within the molecule. These results were used to form a graph of the spark-over of the organic dielectrics (Fig. 11). Further mention is made of the connection between the physico-chemical properties of dielectrics and the lattice energy when the structure is destroyed. The controversial facts noted in real crystals, viz., the mechanical properties of these single crystals changing according to certain rules with the change in the lattice energy, are explained by the behavior of the defects, especially of dislocations, i.e., by the energy of the crystal lattice. One of the possible means for obtaining a controllable concentration of the defects in the lattice is the formation of solid solutions. Upon investigating the electrical properties of the solid

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A051/A029

## Physico-Chemical Problems of Dielectrics

solutions  $\text{CaO-ZrO}_2$ , a defect in their structure was noted (Ref. 47). A complex investigation of the physical properties of the solid solutions  $\text{KCl-RbCl}$ ,  $\text{KCl-KBr}$ ,  $\text{NaCl-NaBr}$  was carried out. It was proven that the general characteristic, which determines the physical properties of a complex dielectric, was the heat of formation. It is expected that a drop in the interaction forces would involve a drop in the strength and an increase in the defect of the solid solution. The relationship between the heat of formation of the solid solution and the average number of particles  $n$  included in the volume of the elementary nucleus (for an ideal single crystal  $n = 8$ ) leads to the conclusion that the more heat absorbed in the formation of the solid solution, i.e., the lower the energy of interaction of the particles in the crystal lattice of the crystal, the more defective is its structure. The connection between the defectiveness of the structure and the lattice energy leads the authors to assume that the laws obtained for the single crystals are also applicable to the polycrystals used commercially. Finally, the authors discuss the connection between the physico-chemical properties of solid solutions of alkali-halide salts. It is said that the introduction of admixtures into the crystal can lead to a change in the interaction between the particles of the crystal lattice of the substance. Experimental data on the physico-chemical

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A051/A029

Physico-Chemical Problems of Dielectrics

properties of solid solutions of ionic compounds are compared and certain assumptions are therefrom derived on the interaction of ions in the investigated systems. The most important value characterizing solid solutions is their heat of formation and reference is made to the formula used by Grimm (Ref. 61) for calculating the energy of the crystal lattice. The heat of formation of the solid solution is estimated experimentally as the difference between the heats of dissolution of the solid substance and the mechanical mixture of components having the same weight and composition. The connection between the heat of formation and the electrical properties of the alkali-halide solid solutions is noted. The electrical strength of NaCl-NaBr, KBr-KJ, KCl-KBr, NaBr-KBr is lower than that of the components. Solid solutions formed by heat absorption have a weakened structure and are characterized by a lowered electrical, schematic and thermal strength, high dielectrical losses and a defective structure. The electrical characteristics of dielectrics are connected with other properties, e.g., in the case of ionic crystals with the lattice energy, in homeopolar crystals with the energy of atomization, in molecular crystals with the energy of intermolecular bonds and in solid solutions with the amount of heat liberated in their formation. All these values are the higher, the higher the mechanical, thermal, chemical and elec-

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Physico-Chemical Problems of Dielectrics

S/063/<sup>20623</sup>60/005/005/012/021  
A051/A029

trical strength of the dielectrics. The authors point out that in selecting new materials for dielectrics compounds with highly-charged atoms (boron, silicon, etc.), should be combined with non-deforming atoms creating rigid bonds (nitrogen, fluorine, etc.). It is worthwhile to investigate the possibilities of using temperatures and pressures obtained in explosive processes and electrical explosions when producing dielectrics to overcome the high activation barriers of the reaction. The problem of selecting new dielectrical materials is a matter for the chemist, as well as the physicist. There are 15 figures, 4 formulae, 1 table and 81 references: 62 Soviet, 12 English, 6 German, 1 unidentified.

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Card 9/9

MELIK-GAYKAZYAN, I.Ya.; ZAVADOVSKAYA, Ye.K.; TRESKINA, M.N.

Effect of firing on the absorption spectra and electric  
conductivity of the crystallophosphors  $\text{BaCl-Pb}$  and  $\text{KCl-Pb}$ .  
Opt.1 spektr. 9 no.1:83-85 J1 '60. (MIRA 13:7)  
(Phosphors—Spectra)  
(Phosphors—Electric properties)

MELIK-GAYKAZYAN, I.Ya.; ZAVADOVSKAYA, Ye.K.

Relation between the F-band half-width of solid solutions of alkali  
halide crystals and their defectiveness. Opt.i spektr. 9 no.4:  
516-517 0 '60. (MIRA 13:11)  
(Alkali halide crystals--Spectra)

85050

247200 (1043,1106,1385)

S/051/60/009/006/012/018  
E201/E191AUTHORS: Melik-Gaykazyan, I.Ya., Treskina, M.N., and  
Zavadovskaya, Ye.K.TITLE: The F-Band Half-Width and the Density of F-Centres in  
Monocrystalline KCl--KBr Solid Solutions

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.6, pp 782-784

TEXT: Several workers (Refs 3-5) studied imperfections in solid solutions of alkali halides. The degree of imperfection was taken to be represented by the difference between the density measured by weighing and the density deduced from X-ray diffraction crystallography. If the imperfections are all Schottky defects (vacancies), then the maximum of the degree of imperfection should occur at the same composition at which the half-width of the F-band is greatest. This was found to be true in KCl--KBr crystals (Ref.5): the maxima of the F-band half-width (Ref.1) and the number of Schottky defects both occurred at 60 mol.% RbCl in KCl. The present paper deals with KCl--KBr crystals grown from solution and from melt. It was found that the maximum of the Schottky defect density ( $\alpha_v$ ) occurred at about 80% KBr, compared with the

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S/051/60/009/006/012/018  
E201/E191

The F-Band Half-Width and the Density of F-Centres in  
Monocrystalline KCl--KBr Solid Solutions

maximum of the F-band half-width ( $\gamma$ ) which was at about 70% KBr (Fig.1). It was also found that the density of F-centres ( $n_0$ ) had a maximum at about 50% KBr and minima at 20% and 90% KBr (Fig.2). The value of  $n_0$  was lower in KBr--KCl solutions than in pure KBr or in pure KCl, due to the lower stability of F-centres in solid solutions (a table on page 783).

Acknowledgements are made to V.V. Boldyrev and A.D. Shchelokov for their advice.

There are 2 figures, 1 table and 6 references: 2 Soviet, 2 English, 1 German and 1 translation from English into Russian.

SUBMITTED: May 3 , 1960

Card 2/2

MELIK-GAYKAZYAN, I.Ya.; MELIK-GAYKAZYAN, V.I.

Device for the determination of solubility in a wide temperature range. Izv. TPI 105:218-221 '60. (MIRA 16:8)

1. Predstavleno nauchnym seminarom radiotekhnicheskogo fakul'teta Tomskogo ordena Trudovogo Krasnogo Znameni politekhnicheskogo instituta imeni Kirova.

(Solubility--Measurement)

MELIK-GAYKAZYAN, I.Ya.; MAYDANOVSKAYA, M.D.

Defects in KCl-KBr solid solutions. Izv.vys.ucheb.zav.; fiz.  
no.1:174-175 '61. (MIRA 14:7)

1. Tomskiy politekhnicheskii inatitut imeni S.M.Kirova.  
(Potassium chloride crystals—Defects)  
(Potassium bromide crystals—Defects) (Solutions, Solid)



ZAVADOVSKAYA, Ye.K.; TRESKINA, M.N.; MELIK-GAYKAZYAN, I.Ya.

Effect of impurities on the electroconductivity and absorption  
spectra of alkali halide crystals. Izv.vys.ucheb.zav.; fiz. no.2:  
66-70 '61. (MIRA 14:7)

1. Tomskiy politekhnicheskii institut imeni S.M.Kirova.  
(Alkali halide crystals)

S/139/62/000/006/031/032  
E039/E435

04.15.00

AUTHORS: Melik-Gaykazyan, I.Ya., Vaysburd, D.I.

TITLE: The formation of F-centres in solid solutions of KCl-KBr

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no.6, 1962, 174-176

TEXT: Samples of single crystals of KCl-KBr solid solution thickness 0.2 to 0.4 mm are irradiated with X-rays (Mo anode, 15 mA, 50 kV) filtered through Zr filter 0.2 mm thick at a dose rate of 170 r/min. The composition is determined from the position of the F-band maximum in the absorption spectrum. Curves showing the dependence of the F-centre density with exposure have a fast nonlinear rise followed by a slower linear rise. The former is assumed to be due to anion vacancies and the latter F-centres formed from radiation generated vacancies. In quenched samples the F-centre density is always higher than for freshly grown samples. The rate of formation of defects must depend directly on the X-ray absorption coefficient and inversely on the energy of the crystal lattice. Results of experiments on irradiation of samples up to a dose of 40800 r show that maximum F-centre density  $\sim 4.3 \times 10^{16} \text{ cm}^{-3}$  is achieved for pure KCl and that the

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The formation of F-centres,...

S/139/62/000/006/031/032  
E039/E435

density falls off steadily as the KBr concentration is increased to  $\sim 0.7 \times 10^{16} \text{ cm}^{-3}$  for 4 mole % KCl. In addition, the slope of the linear part of the F-centre build up curve decreases as the KBr content increases, and in the case of 4 mole % KCl shows that saturation is attained. It is assumed that, under the conditions of these experiments, with the increase in KBr content the rate of destruction of F-centres by X-rays increases faster than the rate of their formation. There are 2 figures. ✓

ASSOCIATION: Tomskiy politekhnicheskii institut imeni S.M.Kirova  
(Tomsk Polytechnic Institute imeni S.M.Kirov)

SUBMITTED: November 14, 1961

Card 2/2

GRIGORUK, L.V.; MELIK-GAYKAZYAN, I.Ya.

Effect of heat treatment and X raying on the activator absorption  
spectra of NaCl - Pb. Opt. i spektr. 7 no.4:515-517 Ap '62.  
(MIRA 15:5)

(Sodium chloride--Spectra) (Radiation)

S/181/62/004/008/031/041  
B108/B102

AUTHORS: Roshchina, L. I., and Melik-Gaykazyan, I. Ya.

TITLE: Effect of dislocations on the distribution of copper impurities in NaCl crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 8, 1962, 2261 - 2263

TEXT: Various properties of pure and copper activated NaCl crystals were studied. The dislocation density and the  $\text{Cu}^+$  ion mobility in rock salt was greater than in artificial NaCl crystals. The number of impurities at crystal defects per activator center is greater in rock salt than in artificial NaCl crystals activated with Cu. This causes a lower activation energy of electrical conduction in rock salt which manifests itself in the observed greater conductivity. There are 2 figures and 1 table. ✓

ASSOCIATION: Tomskiy politekhnicheskiy institut (Tomsk Polytechnic Institute)

SUBMITTED: March 30, 1962  
Card 1/1

L 16713-65 RAEM(c)/ESD(ga)/ASD(a)-5  
ACCESSION NR: AR5000777

S/0058/64/000/010/D028/D028

SOURCE: Ref. zh. Fizika, Abs. 10D215

AUTHORS: Grigoruk, L. V.; Melik-Gaykazyan, I. Ya.

TITLE: Effect of heat treatment on the concentration of color centers in sodium chloride crystals with manganese and cadmium impurity

CITED SOURCE: Mezhevuz. sb. tr. Zap. -Sib. sovet po koordinatsii i planir. nauchno-issled. rabot po tekhn. i yestestv. naukam, vyp. 2, 1963, 50-53

TOPIC TAGS: F center, color center, atomic center, impurity concentration, crystal impurity

TRANSLATION: A study was made of the influence of hardening on the concentration of F-centers and atomic centers (absorption with  $\lambda_{\max} = 320$  and  $340$  nm) in x-ray colored NaCl-Cd and NaCl-Mn crystals. It is found that in such crystals, which have a low im-

Card 1/2

L 16714-65  
ACCESSION NR: AR5000775

observed in all the aggregate states. The number of additional bands is larger in the spectra obtained at liquid-nitrogen temperature.

SUB CODE: OC, OP

ENCL: 00

Card 2/2

L 14982-63 EPT(c)/EWP(q)/EMT(m)/BDS AFFTC/ASD Pr-4 JD  
 ACCESSION NR: AP3004030 S/0139/63/000/003/0015/0017

AUTHOR: Kutsepalenko, V. V.; Melik-Gaykazyan, I. Ya.

TITLE: The effect of irradiation on certain properties of solid solutions of the KCl-KBr system

SOURCE: IVUZ. Fizika, no. 3, 1963, 15-17

TOPIC TAGS: irradiation, defect formation, gamma irradiation, electron irradiation, electron bombardment, radiation damage, solid-solution irradiation, solid solution

ABSTRACT: The effects of irradiation on the yield strength, microhardness, and electrical conductivity of KCl and KBr single crystals and on KCl-KBr solid solutions were experimentally investigated. Two types of irradiation were used: 1) bombardment with 0.7-Mev electrons from an accelerator (average electron current density, 0.13 mamp/cm<sup>2</sup>; the exposure time, 1.5 hr; total electron energy, 10<sup>23</sup> ev/cm<sup>3</sup>) and 2) irradiation with γ-rays from a Co<sup>60</sup> source (activity of the source, 16,000 Curie gram-equivalent; exposure time, 10 days; integrated dose, 10<sup>9</sup> r). As a result of electron bombardment, the microhardness, the yield

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L 14982-63

ACCESSION NR: AP3004030

strength, and the electrical conductivity of single crystals increased by 6, 9, and 130% in the case of KBr, and by 20, 30, and 250% in the case of KCl. Irradiation by  $\gamma$ -rays also caused a 6% increase in microhardness and yield strength of KBr single crystals and a 10 and 20% increase, respectively, in the case of KCl single crystals. Irradiation with  $\gamma$ -rays and electrons had no effect on the microhardness, the yield strength, or the electrical conductivity of KCl-KBr solid solutions. These results are in good agreement with theoretical predictions that solid solutions have higher radiative stability. "The authors thank Professor A. A. Vorob'yev for his participation in setting up this investigation and in the discussion of its results, Professor M. V. Klassen-Neklyudova for making available the relaxometer, Professor A. Kh. Breger for making it possible to obtain the specimen, and A. K. Pikayeva for her aid in specimen irradiation." Orig. art. has: 2 figures.

ASSOCIATION: Tomskiy politekhnicheskii institut imeni S. M. Kirova (Tomsk Polytechnic Institute)

SUBMITTED: 28Dec61

DATE ACQ: 15Aug63

ENCL: 00

SUB CODE: PH

NO REF SOV: 007

OTHER: 003

Card 2/2

IGNAT'YEVA, M.I.; ZAVADOVSKAYA, Ye.K.; MELIK-GAYKAZYAN, I.Ye.

Effect of divalent impurities on the radiation stability of  
alkali halide crystals. Fiz. tver. tela 5 no.10:2775-2779 0  
'63. (MIRA 16:11)

1. Tomskiy politekhnicheskii institut.

ACCESSION NR: AR4034658

S/0196/64/000/003/B004/B005

SOURCE: Ref. Zh. Elektrotekhn. i energ., Abs. 3B25

AUTHOR: Zavadovskaya, Ye. K.; Melik-Gaykazen, I. Ya; Treskina, M. N.

TITLE: Effect of impurity distribution in crystals on the electric conductivity.  
Abstract

CITED SOURCE: Izv. Leningr. elektrotekhn. in-ta, vy\*p. 51, 1963, 179

TOPIC TAGS: crystal electric conductivity, impurity distribution in crystals,  
crystal absorption spectrum

TRANSLATION: I. A. Parfinovich's hypothesis about the impurity ions in the crystal-lattice points being responsible for the long-wave line of additional light absorption in the ultraviolet range is corroborated by experiments with crystals KCl --  $\text{PbCl}_2$  and NaCl --  $\text{PbCl}_2$ . The short-wave line of absorption is apparently associated with the impurity ions situated at the borders of contact surfaces in the crystal. The feasibility of observing dual distribution of impurities in a crystal by means of optical absorption spectra permits solving the problem which of the impurities -- the segregating one at the boundary or the one forming a regular part of the crystal lattice of the base substance -- predominantly

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ACCESSION NR: AR4034658

influences the electric conductivity of the crystal. Experimental results show that Pb introduced into KCl modifies the electric conductivity stronger than Pb introduced into NaCl. Also, the conductivity of KCl — PbCl<sub>2</sub> grown from an aqueous solution is lower than the conductivity of the same crystal obtained from a melt. This conductivity variation agrees with redistribution of absorption lines in the crystals grown from solution. A prolonged annealing of KCl — PbCl<sub>2</sub> and NaCl — PbCl<sub>2</sub> crystals results in a solid-solution decay which is corroborated by a variation in their absorption spectra and in a reduction of their conductivity. [Tomskiy politekhnich. in-t im. S. M. Kirova]

DATE ACQ: 10Apr64

SUB CODE: SS

ENCL: 00

Card 2/2

GRIGORUK, L.V.; MELIK-GAYKAZYAN, I.Ya.

Impurity distribution and formation of color centers under the  
action of X rays in NaCl-Mn, NaCl, and NaCl-Pb. Opt. i spektr.  
15 no.3:394-399 S '63. (MIRA 16:10)

L 1311-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) LIP(c) JD/JG  
 ACCESSION NR: AR5014397 UR/0058/65/000/004/D032/D032

SOURCE: Ref. zh. Fizika, Abs. 4D242

AUTHOR: Ignat'yeva, M. I.; Melik-Gaykazyan, I. Ya.; Grigoruk, L. V.

TITLE: Effect of lead impurity on the concentration of  $F$ -centers in alkali halide phosphor crystals

CITED SOURCE: Sb. Spektroskopiya. M., Nauka, 1964, 176-178

TOPIC TAGS: crystal phosphor, color center, alkali halide, sodium chloride, potassium chloride, potassium bromide

TRANSLATION: The authors study the effect of Pb-content on the number of  $F$ -centers ( $n_F$ ) in NaCl-Pb, KCl-Pb and KBr-Pb crystal phosphors. The Pb-content ( $C_{\max}$ ) is determined which corresponds to the maximum number of  $F$ -centers. The initial growth in  $n_F$  as the activator concentration is increased is due to embedding of the impurity into the fundamental lattice structure at concentrations less than  $C_{\max}$  which increases the concentration of  $V$ - and then  $F$ -centers. The reduction in  $F$ -band absorption with a further increase in Pb-content is associated with that por-

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ACCESSION NR: AR5014397

tion of the impurity which is distributed among defects in the lattice of the phosphor crystal and forms deep electron levels there. N. Maksimova.

SUB CODE: SS

ENCL: 00

*mlr*  
Card 2/2

L 19719-65 ENT(m)/MP(t)/MP(b) IJP(e)/ASD(a)-5 JD/JG/MLK  
S/0000/64/000/000/0178/0180

ACCESSION NR: AT5000429

AUTHOR: Melik-Gaykazyan, I. Ya., Roshchina, L.I.

B + 1

TITLE: Distribution of copper impurities in some alkali halide crystals

SOURCE: Sibirskoye soveshchaniye po spektroskopii. 1st. Kemerovo, 1962. Spektrosko-  
piya; metody\* i primeneniye (Spectroscopy; methods and application). Doklady\*  
soveshchaniya. Moscow, Izd-vo Nauka, 1964, 178-180

TOPIC TAGS: alkali halide crystal, alkali halide phosphor, copper impurity, crystal  
structure, alkali halide conductivity

ABSTRACT: The authors studied crystals of rock salt, NaCl, and potassium halides  
activated by copper by means of the electrothermal diffusion method and by growing  
crystals from the melt by Kiropoulos' method with admixtures of the corresponding  
copper salts. At small concentrations of copper (up to  $6 \times 10^{-3}$  mole %) the increase  
in  $\lambda_{\text{max}}$  the absorption coefficient at the peak of the activator absorption band  $\lambda = 2550$   
Å, was proportional to the rise in the concentration of copper in synthetic NaCl crystals.  
Above this concentration the proportionality broke down, apparently because the impurity  
occupied the blocks and did not participate in the absorption of light at  $\lambda = 2550$  Å.

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L 19749-65  
ACCESSION NR: AT5000429

The difference between the distribution of the impurity in rock salt and synthetic NaCl crystals is discussed. A prolonged high-temperature annealing of K-series crystals containing copper caused the latter to be redistributed. Different distributions of the impurity in crystals had different effect on the properties of these crystals. For example, by penetrating into the regular sites of the crystal lattice, the copper ions did not change the electrical conductivity of NaCl crystals between 20 and 600C. However, the presence of copper in KBr crystals grown from a melt with CuBr decreased the electrical conductivity of these crystals by one order of magnitude or more. This may be due to the presence of the impurity on the blocks in the form of complexes or the phase CuBr. "The authors express their appreciation to Prof. Ye. K. Zavadovskaya for supervising this work." Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 09May64 ENCL: 00 SUB CODE: SS, IC  
NO REF SOV: 003 OTHER: 001

Cord 2/2

ACCESSION NR: AP4028465

S/0181/64/006/004/1243/1246

AUTHORS: Melik-Gaykazyan, I. Ya.; Zavadovskaya, Ye. K.; Ignat'yeva, M. I.

TITLE: Change in electrical conductivity of KCl crystals on addition of bivalent impurities after x-ray irradiation

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1243-1246

TOPIC TAGS: conductivity, electrical conductivity, KCl, KCl crystal, x-ray, F center, Pb doped KCl, Sr doped KCl, F center density, impurity, impurity concentration, current carrier, hole center

ABSTRACT: The authors have studied the ionic conductivity, its radiation change during equal doses of x-irradiation ( $\sim 4 \cdot 10^4$  roentgens) in KCl-Pb and KCl-Sr crystals, and the density of F centers in KCl-Sr. Pb and Sr impurities have altogether different acceptor properties relative to holes.  $Pb^{2+}$  in NaCl is an acceptor of electrons, but  $Sr^{2+}$  in KCl gives rise to activator hole centers. In KCl a comparatively small increase in electrical conductivity accompanying the injection of Sr up to  $2 \cdot 10^{-2}$  molecular percent corresponds to an increase in F

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ACCESSION NR: AP4028465

centers of 210%. The maximum increase in density of F centers in KCl activated by Pb does not exceed 70%. Changes in conductivity with changes in impurity concentration indicate that the first are observed only in the interval of concentration for which a change in conductivity in nonirradiated crystals takes place. Conductivity in a crystal affects radiation change only at those impurities situated in regular points of the crystal lattice. Increased radiation changes in the conductivity of KCl-Pb are observed, first, through decrease in number of current carriers arising during localization of holes at single ion vacancies and, second, because of increased stability of hole centers that have formed through the appearance of electron atomic centers. Orig. art. has: 2 figures.

ASSOCIATION: Tomskiy politekhnicheskii institut (Tomsk Polytechnical Institute)

SUBMITTED: 29Jul63

DATE ACQ: 27Apr64

ENCL: 00

SUB CODE: PH

NO REF SOV: 001

OTHER: 005

Card 2/2

L 11990-65 EWT(1)/ENP(s)/EWT(m)/I/ENP(t)/EEC(b)-2/ENP(b) IJP(c)/AS(mp)-2/  
AFNL/ASD(a)-5/RAEM(c)/ESD(gs)/ESD(t) JD  
ACCESSION NR: AP4048439 S/0181/64/006/011/3484/3486

AUTHORS: Gol'denberg, S. U.; Melik-Gaykazyan, I. Ya.

TITLE: On the kinetics of generation of F centers in NaCl whiskers

SOURCE: Fizika tverdogo tela, v. 6, no. 11, 1964, 3484-3486

TOPIC TAGS: fiber crystal, F center, sodium chloride, x ray irradiation, crystal growth

ABSTRACT: A study was made of the kinetics of the F-center generation in NaCl whiskers irradiated with unfiltered x-rays from a tube with a copper anticathode from a type URS-55a x-ray apparatus operating at 45 kV and 12 mA. The whiskers were either grown (from an aqueous solution or from the gaseous phase) or cleaved (from rock-salt). The dislocation density in the latter is known to be high. Of the samples used, the most perfect were the whiskers grown from the gaseous phase, which have been proved to be free of dislocations.

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ACCESSION NR: AP4048439

up to cross sections of  $30 \times 100 \mu$ . For samples with a high density of dislocations, the F-center growth curves were of the same kind as the growth curves of NaCl single crystals. Dislocation-free samples grown from the gaseous phase had a completely different kinetics of F-center generation, with saturation in the second stage (localization of electrons at radiation-generated vacancies). Similar growth-curves were found for some  $20\text{--}30 \mu$  thick solution-grown whiskers, which were obviously of the "exceptional" type just mentioned. The presence of a linear region in the growth curves indicated the generation of anion vacancies. This supports the conclusions of several workers that radiation may generate vacancies and Frenkel' defects in a perfect crystal. The saturation of the process of the F-center generation may be due to the saturation of the vacancy generation process itself or due to the establishment of a radiation equilibrium between the F-centers and complex electron centers. Measurements of the absorption spectra showed that the position and the half-width of the F-band for all the investigated

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L 11990-65  
ACCESSION NR: AP4048439

NaCl whiskers were the same as for normal single crystals. "The authors thank E. M. Nadgornyy for supplying some whiskers and P. P. Odintsov for his help in assembling the microspectrophotometric apparatus." Orig. art. has: 2 figures.

ASSOCIATION: Politeknicheskii institut im. G. M. Kirova, Tomsk  
(Polytechnic Institute)

SUBMITTED: 28May64

ENCL: 00

SUB CODE: SS

NR REF SOV: 002

OTHER: 012

Card: 3/3

L 62708-65 EEC(b)-2/EMI(1)/EMI(m)/EMP(b)/T/EMI(t) PI-l IJP(c) CG/JD/JG

ACCESSION NR: AP5019730

UR/0379/65/001/002/0190/0200

AUTHOR: Vaysburd, D. I.; Melik-Gaykazyan, I. Ya.

TITLE: Radiation kinetics of accumulation of electron centers in alkali halide crystals in relation to the distribution of absorbed and stored radiation energy based on localization multiplicities

SOURCE: Teoreticheskaya i eksperimental'naya khimiya, v. 1, no. 2, 1965, 190-200

TOPIC TAGS: alkali halide, crystal, color center, lithium fluoride, proton irradiation, F center, radiation damage, radiation effect, alkali halide

ABSTRACT: It was established experimentally that during the irradiation of lithium fluoride single crystals with 1.1-Mev protons, the kinetics of accumulation of F-centers is represented by a curve with a maximum, and the efficiency of the  $F \rightarrow M$  radiochemical reaction increases with the dose and total concentration of F-centers in the isolated and associated state. The following two irreversible processes responsible for the increase in the efficiency of the  $F \rightarrow M$  reaction are analyzed: 1) statistical distribution of F-centers over multiple  $F_2$  centers and 2) statistical distribution of the dose over the localization multiplicity. A kinetic equation

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L 62708-65

ACCESSION NR: AP5019730

for the accumulation of the stored energy with increasing dose is derived which accounts for the experimentally observed complex character of the kinetics of radiation accumulation of  $F$ -centers in LiF. It is shown how 1) the coalescence volume of an  $F$ -center relative to the  $F \rightarrow M$  reaction and the coalescence volume of an  $M$ -center relative to the  $M \rightarrow F$  reaction and 2) the energy localization volume of a single proton in the crystal can be determined from the kinetics of accumulation of  $F$ - and  $M$ -centers. "We thank A. A. Vorob'yev for reviewing the results of this work." Orig. art. has: 6 figures and 15 formulas. [14]

ASSOCIATION: Tomskiy politekhnicheskii institut (Tomsk Polytechnic Institute)

SUBMITTED: 23Oct64

ENCL: 00

SUB CODE: 55, NP

NO REF SOV: 002

OTHER: 005

ATD PRESS: 4064

Card 2/2



L 61525-65 ENT(1)/ENT(m)/EFF(c)/EFF(n)-2/T/REC(b)-2 Fr-h/Pu-h/Pu-h IJP(c)

ACCESSION NR: AP5017286 UR/0181/6/007/007/1994/1996

AUTHOR: Melik-Gaykazyan, I. Ya.; Lutsyn, V. M.

TITLE: Generation of vacancies in KBr-Sr irradiated with a proton beam

SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 1994-1996

TOPIC TAGS: Crystal irradiation, crystal vacancy, radiative crystal vacancy, F center

ABSTRACT: An investigation was made of the accumulation of F-centers in KBr crystals irradiated with protons accelerated up to 6 Mev in a cyclotron so that an experimental determination could be made of the influence of Sr impurity on the radiative generation of vacancies. The concentration of F-centers was determined by the absorption of light in the maximum of the F-band. The parameters for the Mitchell-Froelich kinetic equation were determined on the basis of the accumulation of F-centers. The rate of generation of F-centers on radiative vacancies ( $a^*$ ) depends on the rate of generation of vacancies ( $a$ ), on the capture of electrons by those vacancies ( $c$ ), and on radiative decay ( $\beta$ )  $a^* = ac/c + \beta$  (index \* shows that parameters include radiative decay of F-centers). The generation rate of F-centers in KBr-Sr crystals is greater than in pure crystals. However, this does not mean that the impurity increases the rate of generation of vacancies ( $a$ ), because when an im-

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L 61525-65

ACCESSION NR: AP5017288

purity is introduced into crystal the radiative decay ( $\beta$ ) decreases. Calculation results for single crystals of KBr and KBr + 0.023 mol% SrCl<sub>2</sub> at two different irradiation intensities show that Sr impurities can increase the rate of radiative generation of anion vacancies by several times. Orig. art. has: 5 formulas, 1 figure, and 1 table. [JA]

ASSOCIATION: Tomskiy politekhnicheskii institut im. S. M. Kirova (Tomsk Polytechnic Institute)

SUBMITTED: 21 Dec 64

ENGL: 00

SUB CODE: SS

NO REF SOV: 001

OTHER: 006

ATD PRESS: 4037

L 9671-66 EWT(1)/I IJP(c) GG

ACC NR: AP5027452

SOURCE CODE: UR/0181/65/007/011/3465/3467.

AUTHOR: <sup>44,55</sup> Melik-Gaykazyan, I. Ya.; <sup>44,55</sup> Roshchina, L. I.; <sup>44,55</sup> Ignat'yeva, M. I. <sup>29</sup>

ORG: <sup>44,55</sup> Tomsk Polytechnical Institute im. S. M. Kirov (Tomskiy politekhnicheskiy institut)

TITLE: Accumulation of F-centers in KCl crystals with an admixture of sulfur

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3465-3467

TOPIC TAGS: sulfur, potassium chloride, <sup>21,44,55</sup> crystal defect, color center

ABSTRACT: The number of anion vacancies in a KCl crystal was increased by adding 1 mol % Na<sub>2</sub>S to the melt, thus reducing the concentration of cation vacancies. The state of the cation sublattice with respect to defects was checked by measuring the electrical conductivity in the low-temperature region. Curves for conductivity as a function of temperature show that the conductivity of the doped crystal is two orders of magnitude lower at 120°C than that of the pure KCl crystal at the same temperature. This indicates a reduction in the concentration of isolated cation vacancies, which causes a reduction in the rate at which F-centers are generated on preradiation defects in a KCl-S crystal in comparison with pure KCl. Experimental data are given for the rate of accumulation of F-centers on vacancies produced by radiation, as well as for other parameters of F-center kinetics in both doped and pure KCl. It was found

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L 9671-66

ACC NR: AP5027452

that the sulfur impurity has very little effect on the linear stage of F-center accumulation. Orig. art. has: 2 figures, 1 table.

SUB CODE: 20/

SUBM DATE: 30Jun65/

ORIG REF: 003/

OTH REF: 005

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